Delta Operations for Salmon and Sturgeon (DOSS) Group
Conference call: 1/4/11, 9:00 a.m.

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmon and green sturgeon. DOSS will coordinate the work of other technical teams. DOSS notes and advice can be found at: http://swr.nmfs.noaa.gov/ocap/actions.htm

DWR: Angela Llaban, Mike Ford, Andy Chu
FWS: Nick Hindman
NMFS: Barbara Rocco, Bruce Oppenheim, Barb Byrne
DFG: Dan Kratville
Reclamation: Thuy Washburn, Josh Israel
SWRCB, EPA, USGS: not present

Agenda

1) Fish monitoring
2) Water project operations
3) OMR calculation
4) Second-trigger language
5) Forecasts

Fish Monitoring

Knights Landing: Data from 12/26/10 through 1/3/11 show that 1,441 fish were caught with a peak catch of 500 on 1/2/11. Of the 1,441, 1,355 were fall run, 34 were spring run, 52 were winter run, and an additional 17 were ad-clipped Chinook. Water temperature ranged from 48 to 52°F; flows averaged 23,575 cfs with a high of 25,813 cfs on 12/31/10. CPUE for fall and spring run averaged 47.1 with a high of 164.44 on 12/29/10; CPUE for winter and late-fall run averaged 5.06 with a high of 32.96 on 12/18/10.

Tisdale Weir: Data from 12/26/10 through 1/3/11 show that 1,265 fish were caught, of which 1,188 were fall run, 37 were spring run, 32 were winter run, and were 8 ad-clipped Chinook. There were no late-fall-run salmon caught. CPUE for fall and spring run averaged 74.16 with a high of 155.04 on 1/2/11; for winter run, CPUE averaged 1.94 with a high of 3.73 on 12/31/10. Turbidity averaged 30.83 NTU with a high of 75.7 NTU on 12/31/10. Water temperature averaged 48.3°F; flows averaged 28,543 cfs with a high of 37,800 cfs on 12/30/10. Fall run appear to be small (approximately 32–35 mm). Some thought they are coming down early because of the high flows.

Moulton Weir: Data from 12/26/10 through 1/3/11 show 562 fish caught, of which 541 were fall run, 11 were spring run, 7 were winter run, and 3 were ad-clipped Chinook. There were no late-fall run caught. CPUE for fall and spring run averaged 28.2 with a high of 91.6 on 1/2/11; CPUE for winter and late-fall run averaged 0.43 with a high of 1.19 on 12/31/10. Catch was highest on 1/2/11 with 159 and on 1/3/11 with 186. Flows averaged 27,875 cfs with a high of 45,991 cfs on 12/30/10; turbidity averaged 38.03 NTU with a high of 131 NTU on 12/30/10. Average water temperature was 48.3°F.

Mossdale trawl: Only 2 days reported on 12/26/10 and 12/28/10, only 2 fall run Chinook (35 mm) were caught. No other species of concern were caught.

Sacramento trawl at Sherwood Harbor: From 12/27/10 and 12/30/10, 26 fish were caught, of which 25 were fall run and 1 winter run. Fork length averaged 38.7 mm, with the largest being a winter-run salmon at 93 mm. No other species of concern were caught.

Chipps Island trawl: From 12/26/10 and 12/29/10, 89 fish were caught of which 14 were tagged Chinook (late fall), 10 were splittail, 58 were longfin smelt, and 7 were delta smelt. Fork length of the Chinook averaged 122 mm with the largest being an ad-clipped Chinook at 221 mm. The largest fish caught was a splittail at 240 mm.

Beach Seines: From 12/27/10 through 12/30/10, 509 fish were caught; 441 fall run, 50 spring run, 1 late-fall run, 15 winter run, 1 ad clipped (late fall), and 1 longfin smelt. Average fork length for Chinook was 39.8 mm with the largest being 134 mm.

No steelhead were recorded in any of the upstream monitoring data.

Salvage Data (12/25 to 1/3/11)

CVP: Data on seasonal salvage and loss for fall-run salmon showed 36 salvaged and 10 lost for ad-clipped fish and 16 salvaged and 10 lost for non-clipped fish. Data on late-fall-run salmon showed 219 salvaged and 150 lost for ad-clipped fish, and 164 salvaged and 108 lost for non-clipped fish. For winter run size ad-clipped, there were 67 salvaged and 46 lost, for non-clipped there were 157 salvaged and 100 lost. Total of all races at CVP 322 salvaged and 222 lost (combined total of 544) for ad-clipped fish and 337 salvaged and 218 lost (combined total of 555) for non-clipped fish.

SWP: Data on seasonal salvage and loss for fall-run salmon showed 94 ad-clipped salvaged and 401 lost; there were no non-clipped fall-run fish salvaged or lost. For late-fall run ad-clipped, there were 402 salvaged and 1,722 lost and 32 salvaged and 135 lost for non-clipped fish. For winter run size ad-clipped, there were 192 salvaged and 823 lost and 34 salvaged and 147 lost for non-clipped fish. Total of all races at SWP was 698 salvaged and 2,989 lost (combined total of 3,687) for ad-clipped and 70 salvaged and 298 lost (combined total of 368) for non-clipped fish.

There were no steelhead salvaged at CVP, and 6 non-clipped steelhead salvaged at SWP. Coleman NFH is releasing 717,000 steelhead this week in the upper Sacramento River.

Older Juvenile Chinook Loss and Loss Density

From 12/27/10 through 1/2/11, the daily combined (CVP & SWP) average loss density was 27.04 fish/TAF with the highest loss density being 50.43/TAF on 12/30/10 at the SWP facility. The highest loss density (fish/TAF) was 2.01 on 12/30/10. No OMR flow triggers pursuant to NMFS RPA Action IV.2.3 were met this week.

Operations

San Joaquin R at Vernalis: Flows increasing up to 18,000 cfs by this weekend (1/8/11).

Sacramento River at Keswick Dam: 14,000 cfs currently, and ramping down to 12,000 cfs by Friday (1/7/11).

American River at Nimbus Dam: 12,000 cfs and ramping down to about 8,000 cfs by tomorrow (1/5/11)

Stanislaus River at Goodwin Dam: holding at 500 cfs.

San Luis Reservoir: SWP level is at 750 TAF; CVP is near 800 TAF.

Old and Middle River (OMR) Flow: Current flows are at -4,200 cfs. The 5-day running average is about -4,900 cfs; the official 5-day monitoring will begin on 1/6/11 to meet the NMFS RPA action 4.2.3 (no more negative than -5,000 cfs from Jan. 1 to June 15). DWR is striving to keep flows lower on a daily level and plans to post the OMR data as soon as they have reviewed the data. For calculation purposes, an equation is being used for daily operations and correlated with real numbers to test its accuracy. DOSS will monitor and report out on the 5-day average, but actual compliance (trigger) is based on the 14-day average. Due to tidal variation in the Delta averages are accurate to about 100 to 150 cfs. The 14 day average allows for tidal fluctuations. The actual and predicted flows are very close using the equation; however, compliance is still measured based on actual OMR. DOSS will monitor both actual vs. predicted to see whether they match. NMFS and FWS met with the DWR subgroup to go over these concepts but mainly coordinated between the two projects to schedule exports.

The use of an equation for OMR flows needs to be transparent so that the water contractors can see the rationale for export curtailments. At the annual review in November the Science Panel recommended using an equation developed by the Metropolitan Water District (MWD) for predicting 14-Day average OMR flow (*i.e.*, MWD equation). (See discussion under "Second Trigger" below.)

Clifton Court: Flows will be from 6,500 cfs (1/5/11) to 8,500 cfs.

Reservoirs on San Joaquin side are already hitting the flood-control level. There is a pretty healthy snow pack this year and some reservoirs are already close to full.

Triggers (see also attached *JPE Report (11-15-10).pdf*)

First Trigger

As of January 1, 2011, we began the NMFS Action IV.2.3 (OMR flow management), which calls for new operational criteria. DOSS will monitor a number of different biological triggers in the NMFS BiOp (four of them) instead of the daily logs.

Last year, the DOSS subgroup met but didn't provide any affirmative advice or recommendation on how the second trigger was to be calculated or determined. Today, we sent out what we have

so far. DOSS will review all four triggers even though we don't have a final juvenile production estimate (JPE) for winter run yet. (For background purposes, see Action IV.2.3 Old and Middle River Flow Management, beginning on page 648 in the BiOp.)

NMFS has calculated two initial JPEs for winter run using both the current method and a revised method developed through a contract with Cramer Fish Science in 2010. This new method employs a GoldSim application to statistically calculate uncertainty. Daily fish densities are getting close to the threshold based on the JPE. There are differences in incidental take limits using the traditional method vs. the Cramer Fish Science method. NMFS needs to decide which one to use. DOSS should have a draft number for the fish triggers fairly soon.

Action Item: Reclamation (Israel) will provide JPE estimates to the group using both methods.

For now, DOSS will continue to use the current method/model to calculate the JPE until there is definite direction on using the new, revised model. If DOSS decides in a month that the Cramer Fish Science method is preferred, then DOSS can change the loss-density trigger. It is important to have a threshold value in place, but DOSS can continue to use the current model and investigate the Cramer model within the next month.

The threshold value for the take limit (2% of the JPE) would be 6,958 fish. DOSS can use this now but the number of adults is what really drives that number. 6,958 divided by 2,000 = 3.48 fish/TAF of exports for the first-stage trigger. This is the preliminary estimate of the JPE and JPE-based first trigger. The final JPE will be issued through a letter from NMFS to Reclamation.

Second Trigger

DOSS set up a trigger that was independent of the winter-run JPE and based on just the daily loss rates. The DOSS subgroup came up with a "constant" that would take out high peaks of salvage that occurred on a short timestep. Previously, DOSS could not take an action because they were always days behind on the data and the pulse of fish had already peaked by the time the data was received. The second trigger was based on daily loss to determine whether loss was at a "peak" and take some action over a 5-day period. Actions would begin within 2 days. The DOSS subgroup met and S. Greene summarized (below) the discussion from that meeting as it pertained to the second-trigger calculations. The Science Panel did not weigh in on this.

See attached file *DOSS Trigger Subgroup notes and figs.pdf* for comments on second trigger.

Rationale for a second trigger: A set of spreadsheets presenting 8 and 12 fish/TAF graphs done by S. Greene: 8 fish/TAF cuts off the peaks on winter run or older juvenile loss. The number comes in at about the middle of the peak loss events (3-day events or less).

The action is related to managing OMR flows and DOSS now has a proposal to just reduce exports, but DOSS has also changed the quantification of the thresholds (reversed them). DOSS reversed the order of 8 and 12 fish/TAF because in the original trigger as it was written, the formula did not work. It makes more sense to have a lower value as first trigger at this point after reviewing the formulas. If loss density > 8 fish/TAF, we hit the first trigger. This year, the 3.5 fish/TAF in the JPE-based first trigger will override second trigger. The second trigger needs to be independent of JPE. JPE could be very high, the population very large, and we could end

up with the first trigger being higher than the second trigger. The second trigger would be more likely to cause a need for action because it is independent of the population of fish and reflects more the peaks of salvage.

If the DOSS subgroup decided that those formulas of 8 and 12 fish/TAF were a basis of the salmon decision tree, it should be the final word on it. We are not supposed to come up with a new trigger; we are to come up with what we thought should go into this decision. Out of the subgroup individuals, only three were originally involved in the salmon decision tree. It was a subjective determination based on historical juvenile loss. We don't need to go through subgroup again. We don't need to advise WOMT today; DOSS will clarify the document according to what we discussed. DOSS will clean up the language; for now the first trigger will drive the decision. DOSS will review the notes and previous decision tree documentation graphs, etc., and will have a clear trigger and explanation and the rationale behind it. We need about a week to look at the data and graphs.

Action item: NMFS (Oppenheim) will clear up the language from the subgroup. DOSS will advise WOMT and NMFS that it is revised the method used for the second trigger that did not work. NMFS will issue an official letter on JPE to Reclamation.

Make sure that notes from today get sent to S. Greene for her input.

Date	Action Triggers	Action Responses
November 1 – December 31	Daily SWP/CVP older juvenile loss density greater than 8 fish/thousand acre feet (taf), or daily loss is greater than 95 fish per day, or Coleman National Fish Hatchery coded wire tagged late fall-run Chinook salmon (CNFH CWT LFR) or Livingston Stone National Fish Hatchery coded wire tagged winter-run (LSNFH CWT WNT) cumulative loss is greater than 0.5%.	Reduce exports to a combined 6,000 cfs for 3 days or until CVP/SWP daily density is less than 8 fish/taf. Export reductions are required when any one of the four criteria is met.
	Daily SWP/CVP older juvenile loss density greater than 15 fish/taf, or daily loss is greater 120 fish per day, or CNFH CWT LFR or LSNFH CWT WNT cumulative loss greater than 0.5%.	Reduce exports to a combined 4,000 cfs for 3 days or until CVP/SWP daily density is less than 8 fish/taf. Export reductions are required when any one of the four criteria is met.

Third Trigger

This is based on reading coded wire tags (CWTs) collected at the salvage facilities. For either spring-run surrogates released on 12/21/10, or the winter-run hatchery group that has not yet been released, if they exceed 0.5% of the release, it triggers action. Last year just barely

exceeded that percentage for the spring-run surrogates. By the time we get the CWT data, fish have already passed through the Delta. We need real-time data. NMFS will call FWS to find out if someone can go to the facility each day to pick up the fish with CWTs . There is a tag lab in Stockton with a group of people reading tags all the time, but it is a matter of getting the tags to them in a timely manner.

Reclamation (Israel): The threshold is the same for the first and second levels. Which level would DOSS decide to use and how would it be implemented? There were 76,171 hatchery fish released on 12/21/10; threshold value is 381 fish. The facility gets a lot of clipped fish of other run sizes; all CWTs are read immediately upon delivery from the fish facilities to the FWS office in Stockton. The only hatchery fish in the system now are late fall Chinook from Coleman NFH.

The second trigger based on CWTs does not "reset" so once it's hit, action is taken. It could possibly be hit after one release, but not the other, or hit with each release. It is meant to cover the January–February time period, but it is more likely to have fish from the second release group show up at facility. It's a cumulative total, so once hit it does not reset like the other triggers. Last year cumulative losses hit 0.5%, but DOSS determined that it was throughout the system and lifted the OMR action.

Action item: NMFS (Byrne) will write up this information and provide it to DOSS group.

Fourth Trigger

Similar to second trigger, but uses steelhead instead of salmon. Footnote says that we're using same loss/density cutoff. DOSS has the same issue as with trigger 2: change to 8 and 12/TAF. DOSS will include this as part of clarification of trigger 2.

Salvage vs. loss: currently only salvage data is reported for steelhead, not loss. Last year, DOSS looked at salvage-to-loss expansion for Chinook and applied the same daily rate/adjustment to steelhead. This includes a lot of assumptions; therefore, DOSS should consider other suggestions on how to get loss data from salvage data.

DFG does not currently calculate the loss for steelhead because experiments done showed loss rates were similar to that of Chinook. We assumed that we could use salmon loss for steelhead (4.33 at the SWP and 0.68 at the CVP). None of the fish biologists has a different proposal; therefore, none of the operators do either. DWR is now calculating salmon loss; DOSS could do the same for steelhead (see action item below).

Action item: NMFS (Byrne) will do a mathematical fix as discussed in trigger 2 but until we receive loss data, NMFS could assume that steelhead salvage-to-loss on a particular day is the same as Chinook loss at the facilities.

There are always new studies coming out from investigations at the fish facilities. It's important to use more than just using the salmon decision tree; Reclamation thinks we have more information that would be useful to establish thresholds. DOSS needs to document this using better/newer information. This document would be more of an adaptive management piece instead of a clarification piece.

DOSS believes that the loss expansion for steelhead is approximately equivalent to that of Chinook but will explain that when more information is available.

Action item: NMFS (Byrne) will write up explanation and put out provisional information.

OMR: Method of compliance (measured vs. formula): would be nice to have a decision on which to use. Not sure what timeframe is for the technical team to review and come up with a proposal.

Other Business

1) **Smelt Working Group.** The group met but there were no operational adjustments made; no advice on smelt. Still looking at turbidity but has not triggered an action.

2) **USGS first flush study:** USGS sampled every day through 1/1/11. Data were posted through 12/30 so far. Were getting quite a few delta smelt; had 22 winter run, 50 spring run, and 10 steelhead. They were catching steelhead in the first flush study but monitoring data upstream shows none caught. The total includes trawls and seines. They are calling off the study; turbidity was not high enough—no turbidity numbers yet. Turbidity from the last storm was mainly from reservoir releases so it was not as turbid as anticipated. They might start up again on 1/7/11 and will continue with a new storm event. They want turbidity to be in the 100 NTUs—not in the 10 NTUs. We don't know whether they are using river or Delta model for identification of salmon. Hopefully, they are using the Delta graph for size classification. NMFS (Oppenheim) will check on this.

DOSS Advice to WOMT: Continue to use the current method to calculate JPE, at least for now for the first trigger. Formal language on triggers 2–4 will be reviewed by DOSS.

Next Meeting: Conference call: 1/11/11, 9:00 a.m.